CITY OF BOULDER
OPEN SPACE BOARD OF TRUSTEES AGENDA ITEM

MEETING DATE: December 10, 2008

AGENDA TITLE: Chronic Wasting Disease Study Results

PRESENTER/S:
Open Space and Mountain Parks
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EXECUTIVE SUMMARY:

Chronic wasting disease (CWD) is a fatal prion disease occurring in mule deer inhabiting Open Space and Mountain Parks (OSMP) properties. Beginning in 2005, OSMP and the Colorado Division of Wildlife (CDOW) undertook a 3 year research project to examine CWD on OSMP and private property in the Table Mesa area to increase the understanding of CWD and possibly CWD management. During the course of the study, 131 mule deer were captured and collared and 115 adult deer were monitored. Each deer was tested for CWD status once per year using either tonsil or rectal mucosa biopsy (both techniques developed for testing live animals). In addition, a mark-resight census was performed (visual counts of collared and un-collared deer within the study area are analyzed using a population census model to estimate overall population size) annually to estimate the population of mule deer residing in the study area.

OSMP and CDOW staff participants found CWD prevalence within the study area (south Boulder between Baseline, Eldorado Springs Drive, Broadway and the Flatirons mountain front) to be surprisingly high – overall approximately 29 percent of the deer sampled were infected. Staff also found that average survival time for infected deer was significantly lower than for uninfected deer. Cause of death varied somewhat between years, but the most common mortality causes were mountain lion predation, clinical CWD and vehicle collisions. Mark-resight inventory estimations of the deer population within the study area showed a decrease in local deer numbers over estimates derived from census efforts in the late 1980s. The high prevalence, low survivorship, and decreasing population numbers suggest that CWD is having a measurable effect on the mule deer herd living in south Boulder. High prevalence makes previously discussed management actions such as test-and-cull control unlikely to be feasible.

STAFF RECOMMENDATION:
This is an information item only. No action is requested from the Board at this time.

COMMUNITY SUSTAINABILITY ASSESSMENTS AND IMPACTS:

- Economic: The Open Space and Mountain Parks program contributes to the economic vitality of the city because it provides the setting and services that help to attract a diversity of businesses and to recruit and retain employees. As a result, understanding of wildlife health issues on OSMP properties is crucial.
- Environmental: The extent of CWD infection and associated deer population declines are likely to have some impact on the environment due to the importance of mule deer as large herbivores on OSMP properties. The overall impact of this is presently unknown.
- Social: Wildlife on OSMP support a quality visitor experience and so understanding of disease impacts on wildlife populations is important to maintain a quality visitor experience. Declines in deer populations may diminish the visitor experience by reducing opportunities to view and enjoy mule deer. Because no human health threat has been identified for CWD, direct impacts to the citizens of Boulder are unlikely.

OTHER IMPACTS:

- Fiscal: OMSP funded the study in conjunction with the CDOW. Overall expenditures over 3 years totaled approximately $60,000 in non-staff expenses. CDOW contributed significant funding well beyond that provided by OSMP. Field work was supplemented by funds from the US Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services.
- Staff time: Staff time included time spent as part of the normal work plan of the wildlife ecologist and rangers. Approximately 1.5 seasonal employees were hired specifically to work on the CWD study including capture and monitoring of deer. CDOW provided staffing similar to or in excess of what OSMP contributed.

PUBLIC FEEDBACK:
At the beginning of the study, several members of the public spoke in favor of the study before the Open Space Board of Trustees (OSBT). At that time, the study also received significant media attention including two stories on 9News and one in the Daily Camera. Since the initial start-up phase, no formal public comment has been received; however, numerous informal individual public contacts have been made in the course of conducting field work over the last 3 years. This presentation, as well as a presentation to the Colorado Wildlife Commission, will provide the public with a summary of the results of the study. The primary results of the study recently have been accepted for publication, and additional publications featuring other aspects of the data are likely in the future. Dr. Charles Southwick, professor emeritus at CU Boulder has been involved in consultation throughout the study and appears as a co-author on the submitted study results paper.

ANALYSIS:
Chronic wasting disease is a prion disease occurring in several members of the cervid family including mule deer, white-tailed deer, elk and moose. Presence of CWD in

Boulder mule deer was first detected in 1997, but local prevalence had not been estimated prior to our study. In an effort to understand prevalence and the possible impact of CWD on Boulder and other Front Range deer populations as well as contribute to the broader understanding of CWD in wild cervids, the CDOW proposed a study to examine CWD in mule deer found on OMSP lands and surrounding residential areas in south Boulder.

In summer 2005, OSBT approved the study of CWD on OSMP properties in conjunction with the CDOW. The original memo and study plan are attached (Attachments A and B). Since that time, the OSMP and CDOW staff participants have completed 3 full years of the study including capturing 131 deer. Captured deer were tested for CWD and fitted with a radio collars for monitoring. Age was estimated from tooth wear and blood samples were collected for additional analysis. Deer were monitored throughout the year to determine location, condition and cause of death for individuals that died. Beginning the week of December 8, 2008, the staffs will begin to recapture the 24 remaining, test-negative deer to remove their collars as the batteries begin to malfunction. The 4 positive deer will continue to be monitored as long as their collars function.

During each year of the study, a mark-resight inventory of deer residing within the study area during late November and early December was also completed. These data were analyzed to provide overall population estimates within the study area and were compared between years and to earlier data (1987-2001) collected in this same area using similar methods.

Results:
Prevalence among the male deer sampled was 41 percent, about twice the prevalence among the adult females (20 percent). Life expectancy for uninfected deer was approximately 3 times longer than for infected deer. Main causes of death for infected deer were death from "chronic wasting" syndrome and predation by mountain lions. Mountain lions were more likely to kill infected animals than uninfected animals although this effect varied over years and seemed to be impacted by management of mountain lions in the area. The combination of high infection rates and relatively low survival of infected deer would be expected to cause a decline in deer abundance over time, and the observed trends in deer abundance around Table Mesa appear consistent with these predictions: the occurrence of chronic wasting disease in this population over the last two decades (based on historical field records and observations) has coincided with a measurable decline in estimated deer abundance in this area since the late 1980s.

Next Steps:
Based on the information collected as part of this study, the deer population in south Boulder is predicted, based on population-disease models, to continue to remain low or possibly decline further. However, lack of complete understanding of prion diseases makes this future uncertain. Based on the high prevalence detected, previously discussed management actions such as test and cull are not recommended. Under the circumstances, this situation may best serve as an opportunity to watch and learn how prion disease affects

wild populations over the long term. Follow-up studies looking at population and prevalence trends would be of value in refining predictive models of CWD and its potential control. Although current options for management of the disease are limited, experimental examination of potential management actions still could be considered. Future cooperation between OSMP and CDOW to study the population or experimental management actions will depend on interest and funding availability for both agencies.

Because CWD appears to be negatively impacting this deer population, minimizing additional adverse effects will be important to help maintain the overall viability of this population. Residential development within deer habitat already has been minimized by the presence of OSMP lands, but possible improvement of available habitat quality may merit consideration. Increased disturbance/stress from humans, including disturbance from recreational use (on OSMP, deer have been shown to be sensitive to recreational use- Miller et al. 2001 and Germaine, et al. unpublished data) also may influence habitat use and deer behavior, and these influences also may merit consideration in the context of CWD and overall deer population management.

Although the implications of our findings for the deer population are disconcerting, the study was a success from a scientific and agency cooperation standpoint. No free-ranging mule deer population with CWD has previously been studied in this way, making these data quite valuable in improving the overall understanding of CWD in wild deer populations. The Table Mesa deer population may provide an important opportunity to examine the long-term effects of CWD infection in a wild population. The study logistics went well and cooperation between OSMP and CDOW proved to be extremely beneficial; many strong collaborative relationships were built through the study; including those that led to the current mountain lion study occurring on OSMP properties, making future cooperation likely.

Submitted by:

Michael D. Patton, Director

Heather M. Swanson, Wildlife Ecologist

ATTACHMENTS:

A. Original OSBT memo dated July 27, 2005
B. Original study plan